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Research Article

ENDOMETRIAL HISTOPATHOLOGICAL PATTERNS IN PATIENTS WITH ABNORMAL UTERINE BLEEDING: A SIX MONTHS OBSERVATION OF 285 CASES IN A TERTIORY CARE HOSPITAL

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ABSTRACT

Objectives: the objective of the study was to assess the histopathological patterns of endometrial lesions in patients with abnormal uterine bleeding (AUB) across different age groups.

Methods: A descriptive cross-sectional study was conducted over 6 months at RNT Medical College, Udaipur after the approval of the Institutional Ethics Committee. A total of 285 cases presenting with AUB were analyzed through clinical history, physical examination, and endometrial biopsy. Cases were categorized into reproductive, perimenopausal, and postmenopausal groups for comparative analysis.

Results: The perimenopausal group had the highest incidence of AUB (50.88%). The most common histopathological findings included secretory (39%) and proliferative (31%) phases. Senile cystic atrophy was prevalent in postmenopausal women (38.71%), while endometrial hyperplasia was observed more in perimenopausal and postmenopausal women. Malignant cases, including adenocarcinoma, were rare but significant, particularly in the postmenopausal group.

Conclusion: Age-specific variations in endometrial patterns highlight the influence of hormonal changes and the increased risk of malignancy in postmenopausal women. The findings support the importance of endometrial histopathological evaluation in managing AUB, especially in perimenopausal and postmenopausal patients to identify potentially precancerous conditions.

Keywords: Abnormal uterine bleeding, Endometrial histopathology, Malignancy risk.

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INTRODUCTION

The term abnormal uterine bleeding (AUB) was introduced by the federation of Gynecology and Obstetrics in 2011 to include all AUB with or without any organic lesion.

AUB is a significant clinical condition, with its subgroup, heavy menstrual bleeding, being particularly common, affecting between 14% and 25% of women of reproductive age [1].

It is characterized by uterine bleeding that exceeds the normal volume, duration, or varies in regularity or frequency. Around 30% of gynecological outpatient visits are for AUB and it can have profound effects on a woman's physical, social, emotional, and economic well-being [2].

AUB is an umbrella term that covers both organic and non-organic causes of abnormal bleeding. Dysfunctional uterine bleeding, a subset of AUB, refers to abnormal bleeding with non-organic causes and is seen in about 50% of women with AUB. An endometrial biopsy is typically performed in cases of AUB to rule out organic pathologies. Age and menstrual history play a crucial role in determining the causes of AUB, as they differ based on age and menstrual status [3].

For women of reproductive age, AUB is often linked to pregnancy-related complications, including miscarriages. In postmenopausal women, atrophy and organic pathologies are more commonly the cause [4]. AUB can be further categorized as acute or chronic. Acute AUB refers to excessive bleeding requiring immediate intervention to prevent further blood loss, while chronic AUB describes irregular bleeding that has persisted for the majority of the previous 6 months [5].

Our study particularly aimed at determining the types and frequencies of endometrial pathologies in patients presenting with AUB at our hospital which caters largely to women of all strata majority being low socioeconomic status.

METHODS

Study design

The present study was a descriptive cross-sectional study conducted at RNT medical college and associated group of hospitals for 6 months. The study was approved by the Institutional Ethics Committee.

A total of 285 cases were studied. A detailed clinical history of all patients was taken including physical examination findings, radiological investigations including ultrasound, magnetic resonance imaging, and biochemical examinations (luteinizing hormone, follicle-stimulating hormone, estrogen, progesterone) wherever indicated.

Inclusion criteria

1. All the cases with isolated endometrial causes of AUB were included for the study
2. Only cases with adequate and relevant clinical, biochemical, and imaging data were included.

Exclusion criteria

1. Inadequate sample with no or scanty tissue were excluded
2. Patients with existing pregnancy were excluded.

Aims and objectives

The aims of this study were as follows:

1. To estimate the histopathological types of endometrial lesions in patients with (AUB) in RNT Medical College and Hospital, Department of Pathology, Udaipur
2. To study the patterns of bleeding in women with AUB
3. To categorize the causes of AUB according to age group.

Procedure and technique

Present study was an age-specific comparative analysis of women presenting with AUB, who went endometrial sampling at our hospital and labeled clinically as AUB.

All endometrial biopsies and curettages of women with AUB studied, analyzed and the pattern of uterine histopathological changes was identified and classified.

The tissue sections (3–4 μ) were taken from the already prepared paraffin blocks, and stained with hematoxylin and eosin for microscopic examination. The clinical presentation including the age of the patient and the endometrial histopathology were correlated and compared with those in literature.

Statistical methods

Data were entered in Microsoft Excel and managed using Statistical Packages for the Social Sciences software version 16. Patients were categorized into three age groups, namely, reproductive age group (18–40 years), perimenopausal age group (41–50 years), and postmenopausal age group (>50 years). Analysis was done in the form of percentages and proportions and represented in tables and graphs.

RESULTS

The majority of patients experienced AUB fell within the perimenopausal age group (41–50 years), accounting for 50.88% of the cases (Chart 1). The reproductive age group (18–40 years) makes up 27.37% of the patients. Postmenopausal women represent 21.75% of the total cases (Table 1).

The most common endometrial patterns observed were the secretory phase (39%) and proliferative phase (31%). Senile cystic atrophy accounted for 11% of cases, making it the third most frequent pattern. Less common findings included endometrial hyperplasia (5%), as well as menstrual pattern, endometrial polyp, and pill endometrium, each occurring in 3% of patients (Chart 4). Endometrial adenocarcinoma was seen in 2% of cases, while endometritis, leiomyoma, and squamous cell carcinoma were rarer, each affecting 1% of the population.

Secretory phase was the predominant cause among functional causes while endometrial hyperplasia was the most common pattern observed under organic causes.

Bleeding patterns

Menorrhagia was the most common bleeding pattern, (Chart 2) affecting 74.36% of reproductive-age women and 61.38% of perimenopausal women, accounting for 51.58% of total cases. Metrorrhagia was more frequent in the perimenopausal group, representing 21.38% of cases in this category and 15.44% overall. Menometrorrhagia affected 8.97% of reproductive-age women and 13.79% of perimenopausal women, contributing to 9.47% of total cases. Postmenopausal bleeding was observed exclusively in postmenopausal women, comprising 100% of cases in this group and 21.75% overall as depicted in Table 2.

Age-specific analysis

The most common endometrial pattern in the reproductive-age group was the secretory phase, observed in 46.15% of patients, reflecting normal ovulatory cycles, followed by the proliferative phase, seen in 42.31% of cases, indicating its high prevalence. Endometrial polyps were found in 3.85% of patients, a benign finding that may contribute to AUB. Less common patterns included the menstrual pattern and leiomyoma, each present in 2.56% of cases, while pill endometrium and endometritis were observed in 1.28% of cases. The overall distribution reflects a predominance of normal cyclic endometrial patterns (secretory and proliferative phases) in reproductive-age women, with fewer occurrences of other endometrial conditions.

Table 1: Age-wise distribution of cases

Age group	No of patients	Total (%)
Reproductive (18–40)	78	27.37
Perimenopausal (41–50)	145	50.88
Postmenopausal (≥51)	62	21.75
Total	285	100

In the perimenopausal group, the most common endometrial patterns were the secretory phase (46.90%) and proliferative phase (31.72%). Less frequent findings included senile cystic atrophy, endometrial hyperplasia, and the menstrual pattern, each accounting for 4.83% of cases. Rare findings, such as endometrial polyp, pill (hormonal changes) endometrium, endometrial adenocarcinoma, endometritis, and leiomyoma, ranged from 0.69% to 3.45%.

Senile cystic atrophy was the most frequent pattern in postmenopausal patients, observed in 38.71% of cases, reflecting typical atrophic changes after menopause. The proliferative phase was noted in 16.13%, indicating possible hormonal activity, while the secretory phase appeared in 12.90%, suggesting hormonal influence or replacement therapy. Endometrial hyperplasia was found in 11.29%, highlighting a risk factor for malignancy. Endometrial polyps accounted for 8.06%, and pill endometrium and endometrial adenocarcinoma were present in 4.84% of cases (Table 3). Squamous cell carcinoma, though rare, occurred in 3.23% of patients, requiring prompt attention.

Secretory and proliferative phases were predominant across all age groups, with the highest percentages in reproductive and perimenopausal women. Senile cystic atrophy was unique to the postmenopausal group, accounting for 38.71%. Endometrial hyperplasia appeared in perimenopausal and postmenopausal patients but was absent in the reproductive group. Endometrial polyps and pill endometrium were present in all groups at low percentages. Endometrial adenocarcinoma and squamous cell carcinoma were found only in perimenopausal and postmenopausal groups, with a higher prevalence in the latter.

DISCUSSION

AUB refers to irregularities in the menstrual cycle related to frequency, regularity, duration, or the volume of menstrual flow, excluding pregnancy-related bleeding. It is a common condition, with up to one-third of women experiencing AUB at some point in their lives, particularly around the onset of menstruation (menarche) and during the perimenopausal period. A typical menstrual cycle occurs every 24 to 38 days, lasts between 2 and 7 days, and results in a blood loss of 50–80 mL. Deviations from any of these norms are considered AUB [6].

Endometrial patterns vary significantly across different age groups, reflecting the hormonal changes women undergo during their reproductive years, perimenopause, and postmenopause. Understanding these variations is essential for the accurate diagnosis and management of AUB, which can occur at any stage of a woman's life. This article compares the findings of the present study on endometrial patterns with similar and dissimilar studies, highlighting the differences across reproductive, perimenopausal, and postmenopausal women.

The majority of patients were in perimenopausal age group (41–50 years), accounting for 50.88% of the cases, as were in Anitha *et al.* [7], Kafle *et al.* [8], Bindroo *et al.* [9], and Kunda and Anupam [10] Predominance of different age groups may be due to differences in population characteristics and healthcare access as seen

Table 2: Age-specific distribution of bleeding patterns

Patterns of bleeding	Perimenopausal (%)	Reproductive (%)	Postmenopausal (%)	Total (%)
Menorrhagia	58 (74.36)	89 (61.38)	0	147 (51.58)
Metrorrhagia	13 (16.67)	31 (21.38)	0	44 (15.44)
Menometrorrhagia	7 (8.97)	20 (13.79)	0	27 (9.47)
Polymenorrhea	0	5 (3.45)	0	5 (1.75)
Postmenopausal Bleeding	0	0	62 (100)	62 (21.75)
Total	78	145	62	285

Table 3: Age-specific analysis of endometrial histopathological patterns in present study

Endometrial pattern	Reproductive age (n=78) (%)	Perimenopausal age (n=145) (%)	Postmenopausal age (n=62) (%)
Secretory phase	36 (46.15)	68 (46.90)	8 (12.90)
Proliferative phase	33 (42.31)	46 (31.72)	10 (16.13)
Senile cystic atrophy	-	7 (4.83)	24 (38.71)
Endometrial hyperplasia	-	7 (4.83)	7 (11.29)
Menstrual pattern	2 (2.56)	7 (4.83)	-
Endometrial polyp	3 (3.85)	1 (0.69)	5 (8.06)
Pill endometrium	1 (1.28)	5 (3.45)	3 (4.84)
Endometrial adenocarcinoma	-	1 (0.69)	3 (4.84)
Endometritis	1 (1.28)	2 (2.38)	-
Leiomyoma	2 (2.56)	1 (0.69)	1 (0.69)
Squamous cell carcinoma	-	-	2 (3.23)
Total	(100)	(100)	62 (100)

in Bindhuja [11] and Talukdar *et al.* [12].

As observed in most of the studies menorrhagia was the predominant bleeding pattern observed (51.58%), followed by metrorrhagia (15.44%). This finding was consistent with most of the studies like observation of Talukdar *et al.* [12] Kunda and Anupam [10] and Devi and Aziz [13].

In the present study, normal cyclical patterns (secretory phase being 39% and proliferative phase 31%), were the most common findings overall observed in about 70% of cases supporting the studies done by Anitha *et al.* [7] senile cystic atrophy, seen in 11%, was common among postmenopausal women (Fig. 1). Endometrial hyperplasia accounted for 5%, suggesting might be precancerous condition requiring monitoring. Less common patterns such as endometrial polyps, pill endometrium, and menstrual pattern were each observed in 3% of cases. Malignancies such as endometrial adenocarcinoma (Fig. 2) and squamous cell carcinoma were rare but critical findings, accounting for 2% and 1% of cases, respectively, also seen in. This highlights the need for thorough histopathological evaluation in managing AUB.

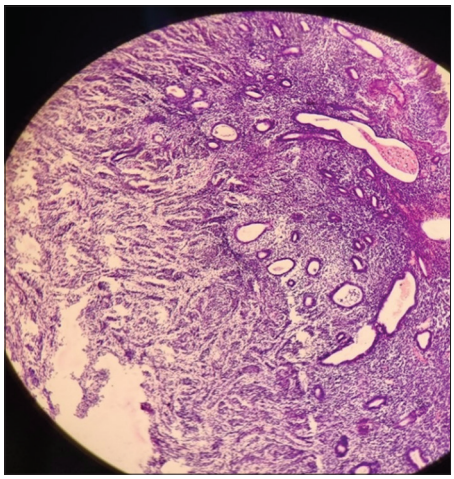

Fig. 1: Histopathological appearance atrophic pattern showing few cystically dilated glands H and E (×100)

Reproductive age group

In the present study, the secretory phase and proliferative phase were the dominant endometrial patterns in reproductive-age women, accounting for 88% of cases. These findings correlate well with studies by Anitha et al. [7] and Sajitha et al. [14], which also observed a high prevalence of normal cyclical phases in this age group. Abnormal findings such as endometrial hyperplasia and polyps were less common in the reproductive age group in the present study, supporting the notion that normal hormonal cycling is typically the cause of bleeding in this population. However, Khan et al. [15] noted a slightly higher incidence of hyperplasia (12%) in this group, suggesting that population characteristics or healthcare access may influence the frequency of abnormal findings. No malignancy was seen in this group.

Perimenopausal age group

In the perimenopausal group, the present study observed that secretory phase (46.90%) and proliferative phase (31.72%) were still prominent, but there was a significant rise in endometrial hyperplasia (4.83%) and senile cystic atrophy (4.83%) as manifested in Chart 3. These findings align with those of Kunda and Anupam [10] and Anitha *et al.* [7], who also reported an increase in hyperplasia in this age group. However,

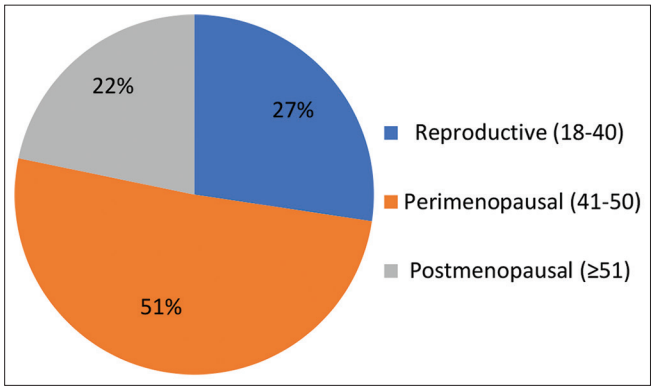

Chart 1: Number of cases

Khan *et al.* [15] reported a higher percentage of hyperplasia (15–18%) in perimenopausal women, reflecting regional or methodological differences.

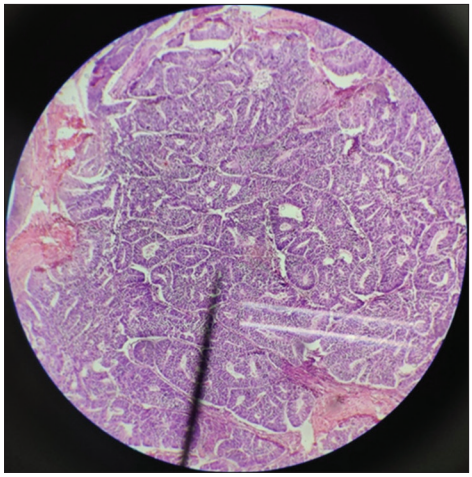

Fig. 2: Histopathological appearance showing endometrial adenocarcinoma having back-to-back glands without intervening stroma H and E (×100)

Notably, the present study identified one case of endometrial adenocarcinoma (0.69%) in perimenopausal women. This finding underscores the importance of investigating AUB in women approaching menopause, as it may signal early malignancy. Devi and Aziz [13] similarly identified cases of adenocarcinoma in perimenopausal women, emphasizing the need for vigilance in diagnosing and managing bleeding in this demographic. Early detection is crucial since malignancies like adenocarcinoma can progress quickly if not identified and treated early.

Postmenopausal age group

In postmenopausal women, the present study found that senile cystic atrophy (38.71%) was the most frequent histopathological finding, followed by proliferative phase (16.13%) and endometrial hyperplasia (11.29%). These results are consistent with studies by Forae and Aligbe [16] and Khan *et al.* [15], who reported similar frequencies of atrophy and hyperplasia in postmenopausal women. The rising rates of hyperplasia and atrophy in this group underscore the changes in hormonal regulation after menopause, which often result in such patterns.

Importantly, the present study found endometrial adenocarcinoma (4.84%) in postmenopausal women, mirroring the findings from Prathipaa and Divya [17] and Anitha *et al.* [7], who reported malignancy rates of 4–5% in postmenopausal women presenting with AUB. Khan *et al.* [15] also observed a similar incidence of malignancy, ranging from 3 to 6% in this group. The increased frequency of malignancy in postmenopausal women is a critical finding, reinforcing the need for timely and thorough investigations of AUB in postmenopausal patients, as this age group carries a significantly higher risk of cancer.

Malignancy across age groups

The findings from the present study are consistent with multiple studies in confirming the association between increasing age and the risk of endometrial malignancy. As women transition from perimenopausal to postmenopausal stages, the risk of developing endometrial cancer rises significantly, with adenocarcinoma being the most common malignancy observed. In the present study, 4.84% of postmenopausal women were found to have adenocarcinoma, which is in line with similar findings by Prathipaa and Divya [17] Forae and Aligbe [16] and Dubey *et al.* [18] where the incidence ranged from 4% to 6%.

The early detection of endometrial hyperplasia and malignancy is critical, as highlighted by Devi and Aziz [13] and Dubey *et al.* [18] who stressed the importance of histopathological evaluation in women with AUB, particularly in perimenopausal and postmenopausal groups. Endometrial hyperplasia, especially when atypical, is a known

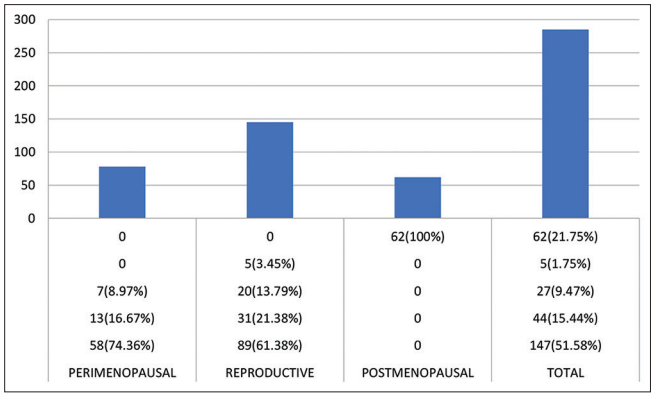

Chart 2: Bleeding patters in present study

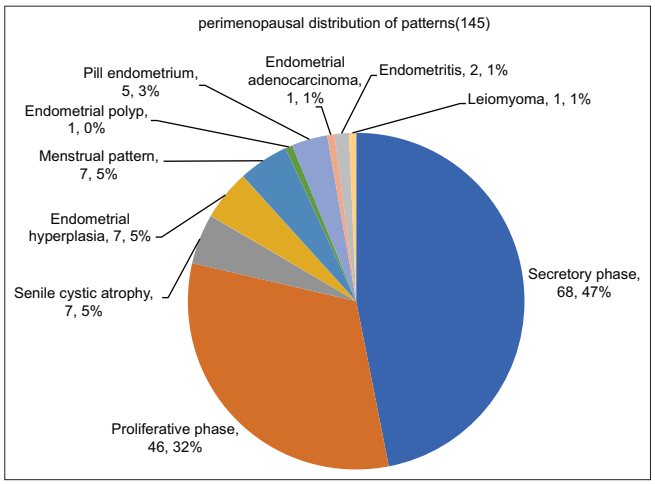

Chart 3: Perimenopausal distribution of cases

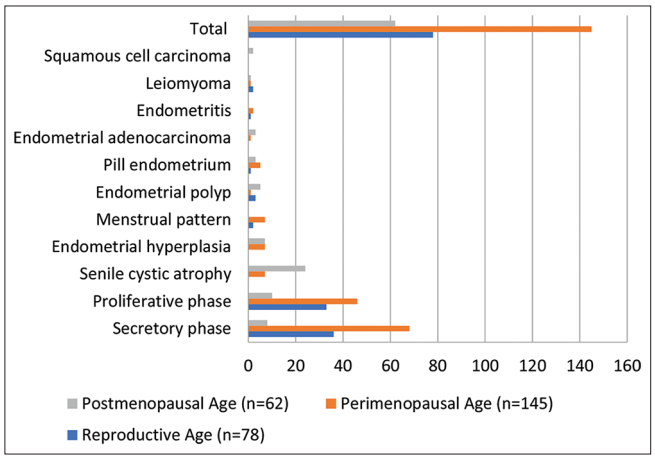

Chart 4: Endometrial histopathological patterns in the present study

precursor to endometrial cancer, with a reported risk of progression to cancer in 5–10% of cases. Therefore, hyperplasia findings, such as the 11.29% observed in the postmenopausal group in the present study, should be closely monitored.

CONCLUSION

The findings of the present study reflect a trend that is well-documented in gynecological research: Endometrial patterns shift with age. In reproductive-aged women, normal cyclical patterns

predominate, while in perimenopausal and postmenopausal women, there is a marked increase in atrophic and hyperplastic changes, as well as malignancies. The association between increasing age and the risk of malignancy, particularly in postmenopausal women, is supported by the present study and several others. This emphasizes the need for regular monitoring and careful management of AUB in older women, where the risk of cancer is notably higher.

AUTHORS OF INTEREST

All authors have contributed equally in the preparation of the manuscript.

CONFLICTS OF INTEREST

None.

AUTHORS FUNDING

None.

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